

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY



(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference OPF04395KR	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/KR2004/003491	International filing date(day/month/year) 29 DECEMBER 2004 (29.12.2004)	Priority date (day/month/year)	31 DECEMBER 2003 (31.12.2003)
International Patent Classification (IPC) or national classification and IPC C12P 17/02(2006.01)i			
Applicant SAMYANG GENEX CORPORATION et al			

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:
 - ☒ Box No. I Basis of the report
 - ☐ Box No. II Priority
 - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Box No. IV Lack of unity of invention
 - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Box No. VI Certain documents cited
 - ☐ Box No. VII Certain defects in the international application
 - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 28 JULY 2005 (28.07.2005)	Date of completion of this report 17 APRIL 2006 (17.04.2006)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 929 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer SEONG, Young Hwan  Telephone No. 82-42-481-5975

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2004/003491

Box No. 1 Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☒ This report is based on translations from the original language into the following language English
which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
☐ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ the international application as originally filed/furnished
- ☐ the description:
pages _____ as originally filed/furnished
pages* _____ received by this Authority on _____
pages* _____ received by this Authority on _____
- ☐ the claims:
pages _____ as originally filed/furnished
pages* _____ as amended (together with any statement) under Article 19
pages* _____ received by this Authority on _____
pages* _____ received by this Authority on _____
- ☐ the drawings:
pages _____ as originally filed/furnished
pages* _____ received by this Authority on _____
pages* _____ received by this Authority on _____
- ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1 - 12	YES
	Claims	None	NO
Inventive step (IS)	Claims	1 - 12	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1 - 12	YES
	Claims	None	NO

2. Citations and explanations (Rule 70.7)

The following documents have been considered for the purpose of this written opinion:

D1: The Plant Cell, Vol.15:1466-1479 (2003-06)

D2: WO 1999/06696 (1999-07-27) ✓

1. Novelty and Inventive Step

The present invention relates to a method for mass production of secondary metabolites by culturing plant cells in a medium treated with alkanolic acid or its salt, and a medium for producing secondary metabolites in plant cell culture comprising plant cell culture medium and 0.1mM to 20mM of alkanolic acid or its salt.

D1 is provided to produce first metabolites by enhancing the expression of a specific protein, wherein transgenic tobacco plants containing P-GUS are treated with sodium butyrate at 5 to 50mM, which are inhibitors of HDAC, to increase the acetylation of the histones present on the PetE promoter.

D2 discloses a process to enhance the efficiency of specific protein production by adding an effective amount of butyric acid or its salt to the culture medium. Specifically, the production of monoclonal antibodies is enhanced by culturing hybridoma cells in a medium containing an effective amount of butyric acid.

The subject matter of claims 1 to 9 is a method for production of secondary metabolites by culturing plant cells in a medium containing alkanolic acid or its salt.

Compared with the present application, none of the above-mentioned prior art documents suggests a method for production of secondary metabolites in plant cell culture by treating a culture medium with alkanolic acid or salt thereof.

The subject matter of claims 10 to 12 is a medium for producing secondary metabolites in plant cell culture comprising plant cell culture medium and 0.1mM to 20mM of alkanolic acid or its salt.

(Continued on Supplemental Sheet.)

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Box. V

Compared with the present application, none of the above-mentioned prior art documents suggest a medium producing secondary metabolites containing alkanolic acid or its salt for plant cell culture.

In addition, concerning the effect in mass production of secondary metabolites in plant cell culture by enhancing secondary metabolism of plant cells with treatment of a culture medium with alkanolic acid or salt thereof, the present invention is remarkable over D1 and D2.

Therefore, the subject matter of claims 1 to 12 of the present invention does not seem to be easily invented by a person skilled in the art by using the teachings of D1 for enhancing the expression of a specific protein and D2 for enhancing the efficiency of specific protein production.

Accordingly, the subject matter of claims 1 to 12 is novel and also involves an inventive step [PCT Article 33(2) and (3)].

2. Industrial Applicability

The present invention relates to a method for mass production of industrially applicable secondary metabolites by culturing plant cells and a culturing medium thereof.

Therefore, the subject matter of claims 1-12 is considered to be industrially applicable [PCT Article 33(4)].